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FACIL:50-400 Shearon Harris Nuclear Power Plant, Unit 1, Carolina 05000400
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SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
ELECTRICAL DISTRIBUTION SYSTEM FUNCTIONAL INSPECTION

Gentlemen:

Carolina Power & Light Company (CP&L) hereby submits formal comments on the Electrical Distribution System Functional Inspection (EDSFI) conducted at the Shearon Harris Nuclear Power Plant (SHNPP) February 12 through March 16, 1990. The essential elements of this letter were discussed with the NRC staff during a meeting on June 12, 1990.

During the conduct of the inspection, members of the NRC inspection team and their management solicited comments on the effectiveness, impact and conduct of the EDSFI. We hope that the input provided at that time was beneficial to the NRC in shaping the future of this inspection program that was piloted at SHNPP. However, our dialog on the inspection ended prior to the issuance of the Inspection Report Number 50-400/90-200, dated April 27, 1990. Because the inspection report stands as the final public record of the EDSFI, the following are CP&L's formal comments on the report.

Two themes which run through the inspection report which were not communicated in the same negative terms at the exit meeting nor in the comments by NRC management representatives in the final week of the inspection are discussed below. Comments on the specific deficiencies discussed in the inspection report are included in the attachment to this letter.

411 Fayetteville Street • P. O Box 1551 • Raleigh, N. C. 27602

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Adequacy of Design

The content of the cover letter and the executive summary make the statement that the design is "adequate." We believe that the record clearly shows that the design of the Harris electrical system fully meets our regulatory commitments and has a relatively large amount of extra design margin. The conservative testing that is performed in accordance with Technical Specification requirements provides assurance of the high quality of normal and emergency power for safety-related systems and components.

While the report identifies nine inspection deficiencies, all of them were described as having low or no safety significance. Nevertheless, conclusions of program weaknesses were identified in the report. In our view, the program weaknesses cannot be drawn from the identified deficiencies. In this respect, the report lacks a balanced tone.

Update of Calculations

Several of the inspection deficiencies and one weakness dealt with comprehensiveness, format, or update of calculations. It is implied from the deficiencies that the inspection team expected that the original design calculations performed by the architect-engineer would conform to the design guidelines and procedures that CP&L has subsequently put in place for plant modifications. This is simply not the case. If there is a need to update a calculation, then the latest applicable procedures are used. As was pointed out in Section 2.0 of the report, we have had reason to periodically update electrical calculations based on changes in design and plant operation. This, however, has not been the case for the mechanical support system calculations and as a result these calculations have not undergone many revisions.

These general comments were discussed with NRC management during the June 12, 1990 meeting. It was our conclusion from that meeting that NRC management believed that CP&L had done well in the EDSFI audit, and in particular, that the electrical design and equipment material condition are sound. It was agreed that the overall tone and balance of the inspection report could have been improved. In addition to the above comments, in the June 12 meeting, CP&L made two specific suggestions for improving the EDSFI "process". First, that a standard rating system similar to that used in the Maintenance Team Inspection be used. Second, that consideration be given to shortening the inspection duration if the team concludes that the primary objectives of the inspection have been satisfied, i.e. that the electrical distribution system has a sound design bases, is reliable, and well maintained.

If you should have any questions regarding this matter, please contact John Eads at (919) 546-4165.

Yours very truly,

Leonard I. Loflin
Manager
Nuclear Licensing Section

JHE/cdl

Attachments

cc: Mr. R. A. Becker
Mr. S. D. Ebneter
Mr. J. E. Tedrow

Deficiency Number 90-200-01

EDG Load Sequencing Calculation

Background

The EDSFI reviewed Emergency Diesel Generator (EDG) Loading Calculation 17-EP. The purpose of this calculation is to demonstrate acceptable voltage and frequency of the safety-related Electrical Distribution System when loads are being sequenced onto the EDG. This calculation was prepared by the vendor of the generator (Parsons Peebles/Electric Products) that is mounted on the EDG skid. The purpose of the EDSFI review was to verify that the content of the calculation provided adequate assurance that the EDG would provide an acceptable power supply.

NRC Deficiencies

Although containing several individual items, this EDSFI deficiency addressed the following major issues:

1. Documentation and conclusions on the effect of sequencer relay timing drift.

2. Absence of validation information for the vendor's computer model.

3. The calculation package did not contain all the information that is required by existing CP&L design guidelines.

CP&L Response

CP&L believes that there is no technical issue in this deficiency. The issue is the quantity and presentation of technical information in the calculation. Responses to the specific points listed above are as follows:

1. As shown in the computer printouts included in Calculation 17-EP, the worst case recovery time to 90% voltage is 1.01 seconds with full recovery in less than 2 seconds. Since the maximum drift on timer setpoint is 0.5 seconds, the minimum possible time between load block starts is 4 seconds assuming a late start of one block and an early start of the next block. These values are confirmed through performance of Engineering Surveillance Tests EST-316 and EST-317. Since the diesel generator voltage will recover in appreciably less time than the minimum possible time between sequenced load blocks, there will be no adverse affect from sequence timer drift. This topic will be addressed in the next revision of the subject calculation.

   In summary, the calculation contained the essential information to reach a favorable conclusion even though it was not stated in explicit terms.

2. NED procedures related to software control cover programs used in-house, and therefore are not applicable to previous work performed by vendors. Control and verification of the software is covered by the manufacturer's QA program. The software used in the above calculation was developed and is maintained by the manufacturer (Parsons Peebles/Electric Products).

3. During the audit, the calculation preparer (Parsons Peebles/Electric Products), verbally provided justification for the assumptions used in the calculations. CP&L has requested the reference documentation which will be incorporated in the next revision of the calculation for clarity.

Conclusion

CP&L believes that there is no technical issue in this deficiency. However, additional supplemental information will be added to the calculation.

Deficiency Number 90-200-02

EDG Air Tank Relief Valves

Background

CP&L initiated an engineering evaluation on April 14, 1989 to review the application of the Crosby Starting Air Relief Valves on the EDG at Harris based on receipt of a Nuclear Network Report (NO. OE-3260) from the Perry Plant. The evaluation (PCR-4406) assessed the Perry acceleration (g) values determined by test (and obtained verbally from Perry) to determine that the Harris valves were enveloped by the Cleveland Electric Illuminating (CEI) Report. This was based on specific Harris seismic input. An additional condition considered was valve position. The Perry problem was initiated when the valves, mounted in the horizontal position, were bumped. The Harris valves are mounted in the vertical position further reducing the possibility of a similar occurrence. The evaluation concluded these valves were acceptable. The fact that the actual qualification report was not obtained at that time was based on the fact that the valve was assured qualified for initial design conditions (with documentation included with the EDG package) and was evaluated for specific loadings and criteria identified, not totally requalified. The total qualification report was later obtained and a complete qualification package generated.

On January 17, 1990, the original equipment vendor (Transamerica DeLaval) informed CP&L under 10 CFR Part 21 that the valves procured for the Shearon Harris Plant had not been seismically qualified, contrary to their original responsibilities to CP&L. Because of the evaluation performed, based on the Nuclear Network Report, CP&L determined that there was no immediate safety problem at Harris. On March 9, 1990 I.E. Notice 90-18 was issued by the NRC.

NRC Deficiency

The EDSFI report stated that "the team concluded that the licensee had not performed a formal design evaluation for the qualification of these valves" based on the absence of the seismic qualification report being on file.

CP&L Response

The EDSFI does not adequately and accurately portray the sequence of events surrounding this issue. CP&L agrees that the qualification documentation maintained by CP&L was inadequate to establish total seismic qualification of the subject valves. However, the conditions questioned were thoroughly evaluated and found acceptable. The seismic qualification package has subsequently been upgraded to include the qualification information based on the receipt of the Part 21 from Transamerica DeLaval. The seismic test report was procured from CEI, subjected

to an engineering review and incorporated into the seismic qualification files. CP&L disagrees with the impression that prior to the EDSFI, the issue had been dealt with on a less than formal basis. The issue had been dealt with from the standpoint of the anomalous behavior of the valves at CEI and subjected to a detailed engineering evaluation.

Conclusion

This issue was subject to previous and ongoing CP&L reviews in accordance with the review of Part 21 notices made to CP&L. As such, the issue of lack of qualification documentation had been already identified to CP&L and would have been corrected. The technical issue of the applicability of the valve had already been the subject of engineering evaluation based on reliable test information from CEI about the valves' seismic qualification test.

Deficiency Number 90-200-03

EDG Lube Oil and Jacket Water Heaters

Background

The design of the Harris Emergency Diesel Generators (EDGs) includes non-safety related heaters in the lube oil reservoir and jacket water reservoir. The heaters are used for maintaining temperatures for minimizing wear on the EDGs during an EDG start as described in FSAR Sections 9.5.5.2 and 9.5.7.2. The heaters are not required during EDG operation. The maintenance of the proper engine temperatures is subject to routine (daily) verification by the logging of EDG parameters.

The fact that the jacket water heaters are powered from non-safety related power supplies is identified in the FSAR (see Section 9.5.5.2). The FSAR does not clearly state that the lube oil heaters are powered from a non class 1E bus. The plant design philosophy as stated in FSAR Section 3.2.1.1 is that Class 1E power would be required only if the function is necessary to assure:

a) The integrity of the reactor coolant pressure boundary (RCPB),
b) The capability to safely shutdown the reactor and maintain it in a safe condition, or
c) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposures of 10CFR Part 100.

These heaters do not perform such a function.

NRC Deficiency

The EDSFI reported that the NRC team position was that the heaters must be powered by a Class 1E power source. The bases that was given for this position was that if the non Class 1E power supply were lost during extreme cold outside air temperature, the EDG would no longer be capable of a successful emergency start within the required 10 seconds.

CP&L Response

The response to this issue contains two basic points. The first (also discussed in Deficiency 90-200-05) is that heaters required solely for temperature maintenance of equipment and not required during emergency operation of equipment need not be designed to Class 1E requirements. This design philosophy is utilized throughout the design for SHNPP. This design philosophy is based on the NRC's guidance provided in Reg Guide 1.29 "Seismic Design Classification."

In the specific example of the EDG heaters, it is unlikely that the non-Class 1E power supply system would be lost without resulting in the operation of the EDG. The Class 1E buses are dependent on the same offsite circuits, transformers and 6.9 KV distribution that feeds the non-Class 1E distribution system. If, on the other hand, the loss of the heaters is due to a malfunction of the heaters, this failure would be possible regardless of the qualification of the heaters. The loss of a specific heater is discussed in the second point.

Secondly, the deficiency does raise the issue whether there is a lower limit for successful operation. A review of the EDG technical information and past EDG starts at low oil temperatures established that there are lower limits of jacket water and lube oil temperature which are required. CP&L has determined that jacket water temperature must be maintained greater than 40 degrees F and that lube oil temperature must be maintained greater than 70 degrees F. These limits have been established in appropriate administrative procedures and will require that if these temperatures cannot be maintained, then the EDG will be declared inoperable.

Conclusion

It is CP&L's position that the key issue is maintaining the EDG lube oil and jacket water temperatures within the appropriate limits. However, the components to maintain these limits do not necessarily require the use of Class 1E equipment. The basis for this position is that only those components necessary for operation of safety related equipment are required to be Class 1E.

Deficiency Number 90-200-04

EDG Air Receivers

Background

The EDGs including the air start systems for SHNPP, were procured from TransAmerica DeLaval. The qualification testing for the EDG included factory run-in tests, type qualification tests, and site tests. The FSAR in Section 8.3.1.1.2.14.k.2, defines which of these tests were used to satisfy the applicable regulatory requirements. For SHNPP, the vendor demonstrated adequate air start receiver capacity using a prototype air start and exhaust system. The FSAR clearly states that the qualification of the air start receiver capacity was performed as a type qualification test in the vendors facility. FSAR Section 14.2.12.1.16, which discusses the specifics on the onsite testing, clearly omits the air start receiver capacity testing.

Notwithstanding these commitments and their approval by the NRC SER, CP&L conducted an onsite air receiver capacity test. This testing was performed with a starting air pressure of approximately 235 psig. This pressure is the nominal air receiver pressure that results when the associated air compressors complete a running cycle. The purpose of the onsite air receiver testing was for commercial reasons. Differences between the air start system used at the factory and the onsite installations are minimal. The size of the piping and number of components are the same. The main exception is that the size of the air receiver at the test facility had a smaller volume than those at Harris.

NRC Deficiency

The EDSFI team concluded after reviewing the start and load acceptance test (performed onsite) that the system had not been adequately evaluated to demonstrate a five-start capability of the EDG at a starting air receiver pressure of 190 psig.

CP&L Response

The interpretation of the FSAR by the EDSFI is incorrect. The FSAR section is incorrectly and incompletely referenced by the inspection report. The entire FSAR passage is provided below:

> 8.3.1.1.2.14.K
>
> Qualification Testing Program - Qualification testing of diesel generator for the SHNPP plant consists mainly of the following steps:
>
> 1. Factory run-in test.
>
> 2. Type qualification test

(a) Start and load acceptance qualification

(b) Load capability qualification

(c) Margin qualification

(d) Sequential loading test

(e) Starting air capacity test

3. Site test

(a) Start and load acceptance test

(b) Load capability test

(c) Design load test

(d) Electrical test

Test Steps 1 & 2, performed at the manufacturer's facility, established test conditions similar to what can be expected at the actual site except that the intake and exhaust system and starting air of the test facility is substituted for the actual equipment. During the preoperational test at the site, test Step 3, the actual equipment is utilized.

This clearly shows that CP&L's commitment on the air start receiver capacity test did not include the requirement to perform a site test with the air tanks initially at 190 psig.

Conclusion

The FSAR commitment has been properly addressed by existing testing and no further testing is required.

Deficiency Number 90-200-05

Design Basis Control

This item addressed four specific mechanical calculations that were reviewed during the EDSFI. The first and second items are addressed together and the latter two are addressed separately below. A summary conclusion for all four items is presented after the conclusion of the fourth item.

Items A & B) Fuel Oil Tank setpoints (Two examples)

Background

The Main Fuel Oil Storage Tanks for SHNPP were initially sized when the SHNPP was a four unit design. The design consisted of four underground tanks. Each tank was to be shared between two EDGs from separate units. Because of this, the original size was determined to be 175,000 gallons (sufficient to accommodate accident loads on one unit while allowing safe shutdown of the other unit). Subsequently, the size of the station was reduced to a single unit. The required quantity of fuel was revised downward. The result was that 74,760 gallons of useable fuel oil would be acceptable. The value is the result of calculation EQS-23, Rev.3 (January 14, 1986). Subsequently, the Technical Specification value for the Main Fuel Oil Storage Tanks was selected in 1986. This value was chosen to be 100,000 gallons (indicated) to envelope the result of the most recent calculation. The Main Fuel Oil Tanks level transmitter feeds a local indicator at the Main Fuel Oil Tanks and feeds a Main Control Board Annunciator. The annunciator is set to alarm when the fuel oil level reaches an indicated level equivalent to 104,970 gallons.

Each EDG has a dedicated Day Tank with a capacity of approximately 3100 gallons. There are several functions that are performed by the level transmitter and level switches on the tank. In ascending tank level these functions are:

1. Low level tank alarm
2. Low level transfer pump start
3. High level transfer pump stop
4. High level alarm
5. High level transfer pump discharge valve closure

When Technical Specifications were developed, CP&L proposed that the Tech. Spec. for the Day Tank be at the nominal point for the shutoff of the transfer pump. After licensing of the plant, it was determined that the allowable range of fuel oil specific

gravity introduced significant uncertainty in determining if the Tech. Spec. LCO (which was stated in gallons) was met. This led to the implementation of a graph which used the most recent Day Tank specific gravity and the indicated level on the Main Control Board to determine if the LCO was met.

NRC Deficiency

On the first item, the EDSFI report states that the calculations were not reflected in the present plant setpoints.

On the second item the EDSFI report states that the basis for the Main Fuel Oil Storage Tank Technical Specification LCO is not reflected in the calculation.

CP&L Response

The setpoints that are used for instrumentation and alarms are consistent with the values derived by calculation. The value used in the T.S. LCO was chosen to envelope the value derived by calculation and that this in turn does not require additional detail be included in calculations.

Item C) EDG Building Fan Calculations

Background

Calculation 9FP-BE-08 was performed to determine the minimum requirements for the AH-85 fan. Each EDG building contains two AH-85 fans housed in a single unit; they are used to provide ventilation for the electrical equipment rooms in the EDG Building. The result of this calculation was a specified minimum flow capability for the individual fans at a specified discharge pressure. This calculation was subsequently used to evaluate and procure specific equipment for the AH-85 application.

NRC Deficiency

The subject calculation did not provide the fan curve analysis of the HVAC air handling unit static pressure, nor did it provide a conclusion.

CP&L Response

Calculation 9FP-BE-08 was performed to analytically confirm system losses and determine flow requirements. Fans were then selected/purchased to meet the criteria set forth in the calculation. The systems were then tested and balanced during pre-operational testing and performed satisfactorily. The tests

demonstrates adequacy of design. This in turn satisfies the design control requirements of 10CFR50 Appendix B.

Item D) Non Class 1E Space Heaters for the EDG Building

Background

The EDG building at SHNPP is a free standing reinforced concrete building which is separate from the balance of the power block. The building is equipped with non-safety related space heaters to maintain the general area temperatures above freezing during winter months. The heaters serve no function subsequent to an EDG start as the singular problem becomes one of cooling the area surrounding the EDG even during winter temperature extremes.

NRC Deficiency

A calculation demonstrated the effect of winter condition temperatures on EDG areas but did not address the acceptance of non Class 1E heater for maintenance of the area temperatures.

CP&L Response

As discussed in Deficiency 90-200-03, it is CP&L's position that temperature maintenance can be performed using non Class 1E equipment. It is irrelevant whether the calculation provides a specific discussion of the subject. The SHNPP FSAR discusses temperature maintenance and clearly states it is non Class 1E. This is in agreement with the guidance in IEEE 622. The FSAR will be amended to include the Diesel Generator Building and the ESW Intake Structure in Section 7.7.1.11.

Conclusion

Each of the examples listed above have been shown to not represent an error in the calculation or an error in the implementation of the results of the calculation. These facts were presented to the applicable members of the EDSFI team. Notwithstanding this, the EDSFI report includes a statement that the "licensee did not have a program to ensure that the mechanical and electrical design bases had been maintained and properly translated into plant operating procedures." CP&L's review of this specific deficiency concludes that these specific items do not lead to such a conclusion.

Deficiency Number 90-200-06

Emergency Load Sequencer Modifications

Background

The emergency load sequencers are used to sequence emergency loads following a loss of offsite power, Safety Injection or a combination of the two. These separate sequencer programs are tested routinely (once every two months) using test circuitry which should not cause actual operation of the actuated equipment. On several occasions, the test has resulted in the unwanted actuation of equipment. The most recent event occurred on September 11, 1989 and was reported to the NRC in LER Number 89-016-00. The investigation of that event led to the discovery that certain relay contacts were not specifically designed to interrupt the DC inductive load that was being switched by certain relays. The affected relays were only used in the test circuit and in the circuit used to reset the sequencer following restoration of offsite power or following reset of Safety Injection.

When the overloading problem was identified as a result of the evaluation of the last event, it was determined that the vendor did not have a DC inductive rating for the contacts. It was decided to approach the problem along two paths. First the contact load was reduced to a value that appeared acceptable based on engineering judgment. Second, testing was to be performed to quantitatively determine an acceptable rating.

This testing had not been completed prior to the EDSFI because of delays in procuring the extra relays for the test.

NRC Deficiency

The design control for the application of the relays in DC circuits in the load sequencer was inadequate in that suitable equipment was not procured for the specific application.

CP&L Response

The result of the relay testing demonstrated that the reduced relay contact rating was still not sufficiently low to prevent relay failure. For the case of the Potter Brumfield relays which were initially identified with the overloaded condition, the failure mode did not prevent successful sequencer operation, but did prevent sequencer reset. However, the testing suggested additional equipment misapplication with microswitches attached to Agastat relays. Testing of these microswitches demonstrated that these switches could also fail. The failure mode and consequences were determined to be more severe. The consequences included the failure of the sequencer to properly shift from the loss of offsite power program to the Safety Injection Program if these two

signals did not occur simultaneously. The sequencers were both subsequently modified to address both of these problems.

The discovery of this additional problem was determined to be reportable to the NRC under 10CFR 50.72 on May 24, 1990. LER 90-015 has been submitted to the NRC to describe in detail the corrective actions that have been taken. The issue has also been determined to be reportable to the NRC under PART 21 since the sequencer design was developed by Ebasco Services, Inc.

Summary

The problem with the sequencer relays, which was previously identified by CP&L prior to the EDSFI, has now been corrected. As described in LER 90-015, CP&L conducted a review of similar DC relay applications in safety related circuits, without discovering any similar misapplications.

Deficiency Number 90-200-07

Dedication of Commercial Grade Components

Background

Components in safety-related motor control centers and relay panels for the SHNPP were replaced using commercial grade equipment. The dedication process included testing for proper operations in the intended application, but did not include new seismic testing of the parts. The key assumption in this approach is that the manufacturing process for the breaker or relay would not be changed to the degree requiring new qualification testing without having some other result on the physical characteristics. This approach was presumed to be an acceptable practice.

However, in recent years, the industry has recognized that more effort needs to be applied to confirm the critical characteristics of commercial grade items prior to use in safety-related applications. CP&L began implementing the guidance of EPRI NP-5652 on January 1, 1990. Rigorous review of critical characteristics is now done for commercial grade dedications. CP&L had made plans to review past dedications when generic critical characteristics were defined for a particular component type.

NRC Deficiency

The EDSFI report stated that the practice of using commercial grade breakers in like-for-like replacements without a detailed evaluation of any changes that may have been introduced by the manufacturer was unacceptable.

However, in a subsequent telephone conversation with members of the NRC's Region II staff, CP&L was informed that the NRC would not pursue this issue based on the generic nature of the issue and the active work by the entire industry to investigate and correct current practices.

CP&L Response

The commitments made with regard to the review of breaker and relay qualification are proceeding within the context of the new commercial grade dedication program. The actions which were commited during the EDSFI inspection will be complete by the end of the next refueling outage.

Deficiency Number 90-200-08

Failures of LK-16 Type Breakers

Background

The plant design employs LK-16 circuit breakers in approximately 120 nonsafety related and 18 safety-related applications. The breakers were procured based on successful qualification of the breakers to applicable industry standards. In addition, safety-related breakers were seismically qualified in accordance with IEEE Std 344-1975. The LK-16 breaker was used both to control the starting and stopping of loads (medium sized motors) and for power distribution (motor control center feeder breakers). Starting during hot functional testing in 1986, the plant experienced failures of the LK-16 breakers in nonsafety applications to open on demand. From the very beginning, root causes were identified and corrective actions implemented. The specific history of the breakers and corrective actions will not be repeated here.

The result of CP&L's detailed, independent, multidisciplined, interdepartmental investigations which began in the fall of 1989 have resulted in two important facts. First, the failure mechanism is random in nature and second, the failure mechanism can best be summarized as dependent on the addition of opening and closing resistive forces in each particular breaker. The testing performed in 1989 and early 1990 on the unmodified breakers showed that the failure rate was on the order of 1 failure for every 1000 demands.

NRC Deficiency

The EDSFI team concluded that this problem was an apparent violation of 10CFR50 Appendix B Criterion III which requires design control measures to verify that equipment is suitable for the intended function.

CP&L Response

During the extensive review of the LK-16 problem, there have not been any questions as to whether the initial qualification per industry standards was in error. It is CP&L's opinion that the tolerances applied in the manufacture of the breaker were not sufficient to achieve acceptable performance of the breaker in the field.

As indicated in the EDSFI report, CP&L has implemented an enhanced preventive maintenance program for the safety-related LK-16 breakers. The program is designed to assure that adequate margin exists in the operating mechanism and is based on the results of extensive testing performed to measure the net forces in the breaker.

The root cause has been identified as an inadequate design margin in the opening spring force. The critical characteristics affecting the opening and restraining force balance were not adequately controlled causing random variations in the threshold force value required to open the breaker.

Several modifications have been proposed and subjected to a CP&L validation test program. A modification will be installed when appropriate validation and certification testing is completed.

Conclusion

CP&L has diligently pursued the problems with the LK-16 breakers and will continue until an acceptable performance is obtained in field experience. In the meantime, the enhanced Preventive Maintenance program for the safety-related breakers provides assurance that a failure on demand remains random and is considerably less than 1 in 1000.

Deficiency Number 90-200-09

Testing of Class 1E Underground Cables

Background

Prior to the issuance of the Construction Permit, during the review of the PSAR, the NRC identified a series of concerns with regard to each PSAR section. A concern was identified with the compliance with General Design Criterion 17 dealing specifically with the qualification of underground power cables. CP&L's response was to commit to institute testing of underground power cables. The commitment is written into FSAR Section 8.3.1.2.37, which deals with the power distribution system. During the last two refueling outages, 6.9 kv and 480 vac power cables which are installed spares were meggered to verify that the required insulation characteristics were available.

NRC Deficiency

The EDSFI report contends that the commitment for testing of underground cables encompasses low voltage power cable, instrumentation cables and control cables. The absence of this testing was written as apparent violation of requirements of 10CFR50, Appendix B, Criterion XI.

CP&L Response

The safety related cables used in underground duct banks are specifically qualified for that service in accordance with specification CAR-SH-E-14A and 14B. Supplemental testing is not required to demonstrate adequate qualification. The requirement to test the higher voltage power cable was the direct result of the concerns that existed at the NRC in the late 1970s with high voltage cable, not with low voltage power and control cables. The commitment to test higher voltage cables will be reassessed to determine if it can be removed from the FSAR entirely.

Conclusion

The FSAR commitment was never intended to cover low voltage cables as presented in the NRC deficiency.